ABSTRACT

A distributed sensing system and method improves sensing of events that may require restraint deployment in a vehicle by distinguishing between deployment events and non-deployment events using data from more than one sensor.

A transmission check process continuously monitors an incoming signal from a sensor and counts the number of data samples that exceed a selected value using a counter. If the counter value exceeds a selected threshold, the system indicates that the transmission check is fulfilled and allows deployment of the restraint.

A correlation acceleration difference (CAD) algorithm calculates a CAD term corresponding to a degree of intrusion of a foreign object into a vehicle at a given time. Acceleration data from sensors disposed at supporting sides of the vehicle are checked if they respond to an event, and the absolute values of the acceleration data are subtracted from each other to obtain an absolute difference from which the CAD term is calculated.

A method of reducing runtime in a system algorithm prioritizes calculations so that they are conducted on the side having the higher likelihood of having conditions requiring restraint deployment. Prioritizing calculations may also avoid refiring on a side that has already deployed a restraint, reducing the total number of calculations that the system needs to conduct.

A method of evaluating a plausibility that a fire decision from a given sensor is the result of an event necessitating deployment of a restraint includes a plausibility check that checking the states of other sensors in the system before issuing a restraint firing request. The specific terms used in the plausibility check can be adjusted to accommodate different vehicle hardware configurations, vehicle setups and requirements.